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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,466	01/22/2002	Antoine J. Rouphael	2001P15530US	9756

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Siemens Corporation
Attn: Elsa Keller, Legal Administrator
Intellectual Property Department
186 Wood Avenue South
Iselin, NJ 08830

EXAMINER

LU, JIA

ART UNIT PAPER NUMBER

2634

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,466

Applicant(s)

ROUPHAEL ET AL.

Examiner

Jia W. Lu

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/22/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6, 12-17, 23-29, 32-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Ke Du in US patent 6,307,884.
 - a. Regarding claim 1, patent '884 shows a decision feedback equalizer comprising: a first feedback equalizer (figure 7, elements 152, 156, 160, 164 and 202) for generating a first output signal (figure 7, "ak1") and for calculating an uncertainty and generating a first error signal (figure 7 "ek1"), a second feedback equalizer (figure 7, elements 162, 154, 158, 204 and 166) for generating a second output signal (figure 7, "ak2") and a second error signal (figure 7, "ek2"), first and second error processing units (figure 7, elements 168 and 170), a decision device generating a control signal (figure 7, elements 172 and 174), and a switching unit (figure 7, element 176) controlled by control signal for selecting the first or second output signal.

Art Unit: 2634

- b. Regarding claim 12, patent '884 discloses the use of the system described above in a mobile unit (column 1, lines 18-19).
- c. Regarding claims 23 and 33, patent '884 shows a method of processing digital symbols comprising the steps of: processing the sequence of digital symbols (figure 7, "ak1" and "ak2"), determining an uncertainty in the processing (figure 7, "ek1" and "ek2"), and if the uncertainty exceeds a predetermined threshold (column 6, lines 32-48), processing at least two sequences of digital symbols (figure 7, "ak1" and "ak2") where at least one parameter is set differently in each sequence (column 6, lines 37-39), and deciding upon a calculated error for each sequence (figure 7, elements 168 and 170) which sequence is used to generate an output signal (figure 7, elements 174 and 176).
- d. Regarding claims 2, 3, 13, 14, 24, 25, 34 and 35, patent '884 further shows a forward filter (figure 2, element 136), an adder (figure 7, element 160), a slicer (figure 7, element 152), and a feedback filter (figure 7, element 156).
- e. Regarding claims 4, 5, 15, 16, 28 and 38, patent '884 further shows a buffer memory for storing the slicer output (figure 7, elements 164 and 166).
- f. Regarding claims 6, 17, 26 and 36, patent '884 describes the use of a Viterbi detector in its equalizer (column 2, lines 10-14).

- g. Regarding claims 27 and 37, patent '884 describes the step of deciding which processing path is selected to be activated by an error threshold (column 6, lines 32-48).
- h. Regarding claims 29 and 39, patent '884 describes the number of buffered output signals to be proportional to the time for determining the decision (column 6, lines 52-56).
- i. Regarding claim 32, patent '884 describes that at least one parameter of the processing of the selected sequence is transferred to the processing of the other sequence (column 7, lines 33-37).

Claim Rejections - 35 USC § 103

- 3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
- 4. Claims 7-9, 18-20, 30, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 6,307,884 as applied to claims 1 and 12 above, and further in view of US patent 6,341,360.
 - a. Claims 7, 18 and 41 inherit the limitations of claims 1 and 12 above; however, patent '884 does not disclose the initiation of a decision process upon a predefined number of consecutive ambiguous decisions. Patent '360 shows the initiation of a decision process upon a predefined number

of consecutive error decisions (abstract, lines 7-12). Because the ambiguity decision of present claim is derived from error calculations, it would have been obvious to one ordinarily skilled in the art at the time of invention to use a consecutive number of errors in a decision feedback equalizer as described in patent '884 to initiate a decision process, because this provides a measure of stability for the decision feedback equalizer under transient high noise conditions.

- b. Claims 8, and 19 inherit the limitations of 7 and 18 above; further, patent '884 describes at least one parameter of the first feedback equalizer to be set different after starting the decision process (column 7, lines 19-24).
 - c. Claims 9 and 20 inherit the limitations of 8 and 19 above; further, patent '884 describes the changed parameters of the selected feedback equalizer to be transferred to the other feedback equalizer (column 7, lines 35-37).
 - d. Regarding claims 30 and 40, patent '360 shows the calculation of error to be a mean squared error calculation (column 10, lines 24-26). It would have been obvious to one ordinarily skilled in the art to use a mean squared error calculation in an equalizer system described in patent '884 to calculate error in order to efficiently account for all data and power to generate the most representative error value.
5. Claims 10, 21, 31 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 6,307,884 as applied to claims 1, 12, 23 and 33

above, and further in view of US patent 6,816,548. Patent '884 describes the use of an adaptive forward filter (column 4, line 50), however it does not describe the feedback equalizer to be adaptive. Patent '548 shows the use of both an adaptive forward and adaptive feedback filters (abstract, lines 3-5). It would have been obvious to one ordinarily skilled in the art to make the feedback filter adaptive in an equalizer in order to dynamically compensate for the effects of constant changing channel conditions and disturbances on the signal transmission channel.

6. Claims 11 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 6,307,884 as applied to claims 1 and 12 above; further, patent '884 shows an equalizer that selects between two feedback equalizers (figure 7, elements 156 and 154). It would have been obvious to one ordinarily skilled in the art to use more than two feedback equalizers to further increase the states and options available in the selection process and hence further increasing the accuracy in equalization.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jia W. Lu whose telephone number is 571-272-6042.

The examiner can normally be reached on Mon- Fri, 9:30AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jia Lu
Examiner



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